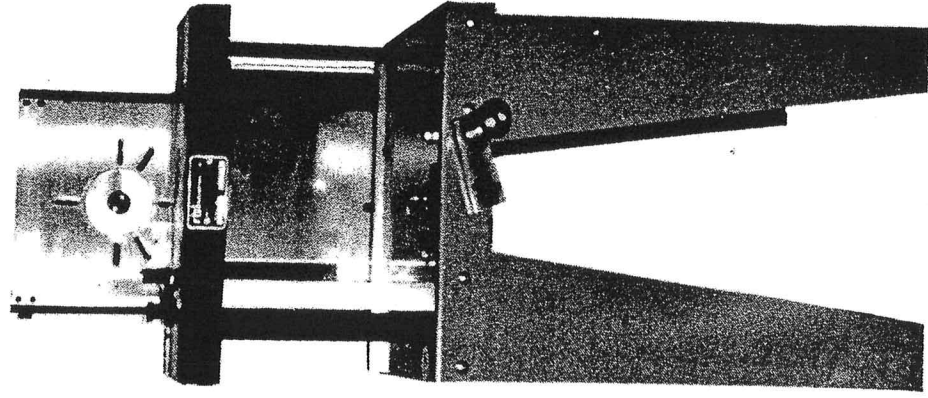

rbi

MODEL 1218

Joint Machine



BUSHTON MFG
P.O. Box 127, 319 South Main Street
Bushton, KS 67427
620-562-3557
customerservice@hawkwoodworkingtools.com



WARRANTY

We guarantee each R.B.I. Joint Machine to be free from defects in material and workmanship for 1 year from date of delivery to original user. This warranty does not cover damage sustained in transit or from misuse of this piece of equipment.

This warranty does not obligate us to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts, nor shall it apply to any Joint Machine upon which repairs or alterations have been made unless authorized by us.

We make no warranty in respect to components, not of our manufacture, including electric motors, such being subject to the warranties of their respective manufacturers.

We shall in no event be liable for consequential damages or contingent liabilities arising out of the failure of any Joint Machine to operate properly. No express, implied or statutory warranty other than herein set forth is made or authorized to be made by us.

ENCLOSED WARRANTY REGISTRATION CARD MUST BE RETURNED TO VALIDATE YOUR WARRANTY.

TO VALIDATE WARRANTY, CUSTOMERS MUST MAIL IN WARRANTY CARD ON RECEIPT OF MACHINE.

BUSHTON MFG

P.O. Box 127, 319 South Main Street

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ADDITIONAL SAFETY INSTRUCTIONS FOR THE JOINT MACHINE

1. Do not use lumber with loose knots or splintered surfaces.
2. Always use miter gauge whenever possible.
3. Be sure router mounting screws are tight before operating.
4. Avoid feeding workpiece into bit from the right side of the table.
5. Be sure knobs on table tilt bars are tight before operating.
6. Use cutter guard when possible.

ASSEMBLY INSTRUCTIONS

The 1218 Joint Machine is shipped partially assembled and requires some set-up assembly. Remove the shipping carton from the Joint Machine and check to see that all parts were received without damage. After the carton is examined, finish assembling the machine.

CONTENTS OF 1218 JOINT MACHINE CARTON:

Item	Qty.
1. Joint Machine (partly assembled)	1
2. Hinged Table Top Assembly	1
3. Extension Tables	1
4. Cutter Guard	2
4. Hardware Bag Containing:	1
Crank And Handle	1
Miter Gauge	1
1/4" x 1" Allen Head Cap Screws	1
5/16" x 1" Bolts	3
5/16" Flat Washer	2
5/16" Lock Washer	2
5/16" Hex Nut	2
3/8" x 1" Hex Head Bolts	2
3/8" Lock Washers	4
3/8" Flat Washers	4
5/16" x 2 1/2" Table Pins	4
1/4" x 1 1/2" Table Tilt Stop Pin	2

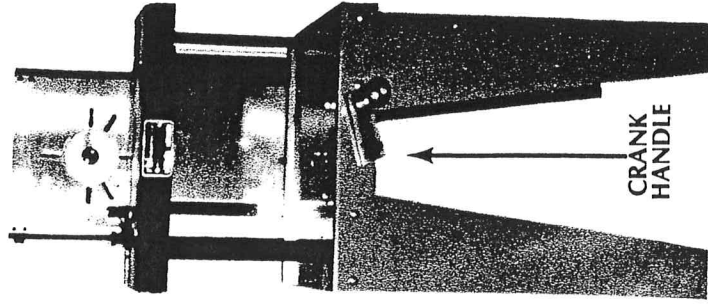


Fig. 1

1. Install crank handle to the 1/2" diameter crank handle shaft located in the base. (fig. 1)
2. Place the hinged plate assembly on the base on the side opposite the crank handle. The router hole should be up. Mount the lower plate to the cross brace with three 1/4"-20 x 1" allen head cap screws.
3. Fasten the back braces to the base with two 5/16" x 1" bolts, lock washers, and nuts.
4. Install router in router housing and secure at desired bit depth.
5. Install the two extension tables, if desired, with four 3/8"-16 x 1" hex head bolts with flat and lock washers. Secure and level the tables by adjusting the 1/4" allen set screws.

INSTRUCTIONS FOR MAKING JOINTS

Table movement distances are given in turns of the JM-35 crank handle bar. **EACH COMPLETE TURN MOVES THE TABLE 1/16"**. When the table is level with zero on the JM-16 scale, the working surface of the table is approximately level with the center of the router bit. **ALWAYS USE THE MITER GAUGE WHEN POSSIBLE.**

SUGGESTIONS FOR MAKING ACCURATE JOINTS

1. Be sure top plate is at correct setting for the particular joint. Use a machinists' square or drafting triangle for checking the angle.
2. Be sure miter gauge is properly adjusted to the correct angle.
3. Use only good quality router bits that are of accurate dimensions and discard them when they become dull.
4. Test and measure the diameter and depth of cut of a bit in a scrap piece before beginning the joint, particularly the large and small diameters of dovetail bits.
5. Be sure the table is level with the base.

ADJUSTING BIT TO REFERENCE POINT

The most common reference point used in the following instructions is the point at which the top of the bit is level with the working surface of the table. Refer back to this procedure when necessary.

1. Lower the table until the bit appears to be slightly below the working surface of the table.
2. Acquire a scrap piece of wood with a square edge.
3. Turn router on.
4. Pass approximately 1" of the piece over the bit and retract. If the bit does not make contact with the wood, lower the table slightly and make another pass.
5. Continue until bit contacts wood. If not sure if bit has contacted the board, feel the edge that passed over the bit. If contact has been made, a slight notch will form in the wood where the cut stops.

STRAIGHT JOINTS

All of the following joints utilize a 5/16" straight router bit unless otherwise specified.

FINGER BOX JOINT

Bit depth and finger width should be equal to the thickness of the material. Although the following procedure utilizes a 5/16" bit, other sizes may be used. The distance that the table is moved in each step should be equal to the diameter of the bit.

1. Label each piece that is to be used (workpiece A and workpiece B).
2. Adjust bit height to reference point (see procedure).
3. Lower the table 5 turns. Cut an end groove in workpiece A using the miter gauge.
4. Lower the table 5 turns. Cut an end groove in workpiece B. (fig. 2)

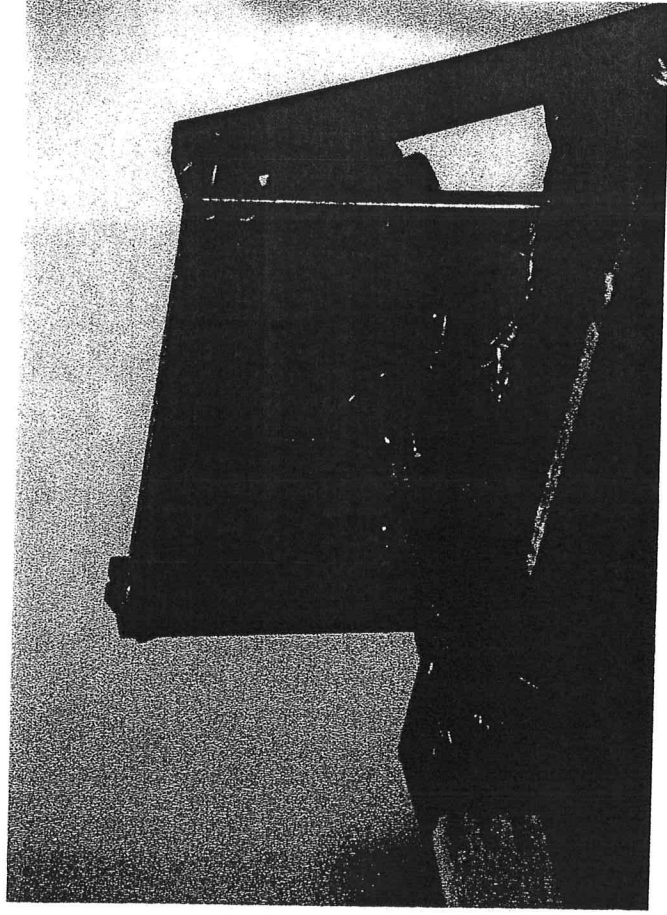


Fig. 2

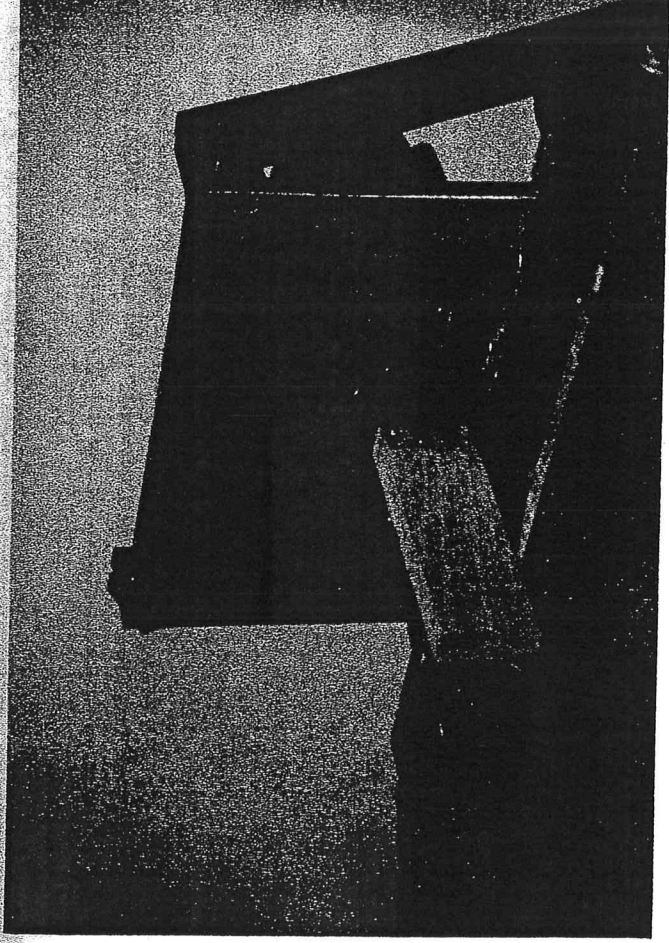


Fig. 3

5. Lower the table 5 turns. Cut an end groove in workpiece A. (fig. 3)
6. Continue this pattern, alternating boards with each step, until the joint is completed.

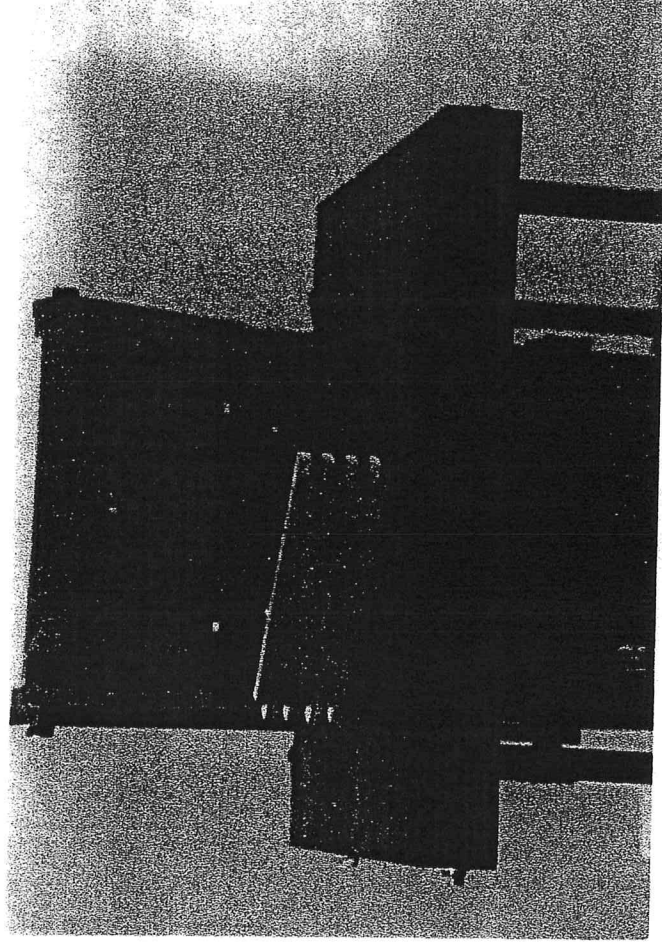


Fig. 4

7. Assemble joint and check fit. (fig. 4)

DADO BOX JOINT

Bit depth should equal $1/2$ the thickness of the material.

1. Label all boards to be used A or B. Workpiece A will have the pin and workpiece B will contain the socket.
2. Adjust bit height to reference point (see procedure).

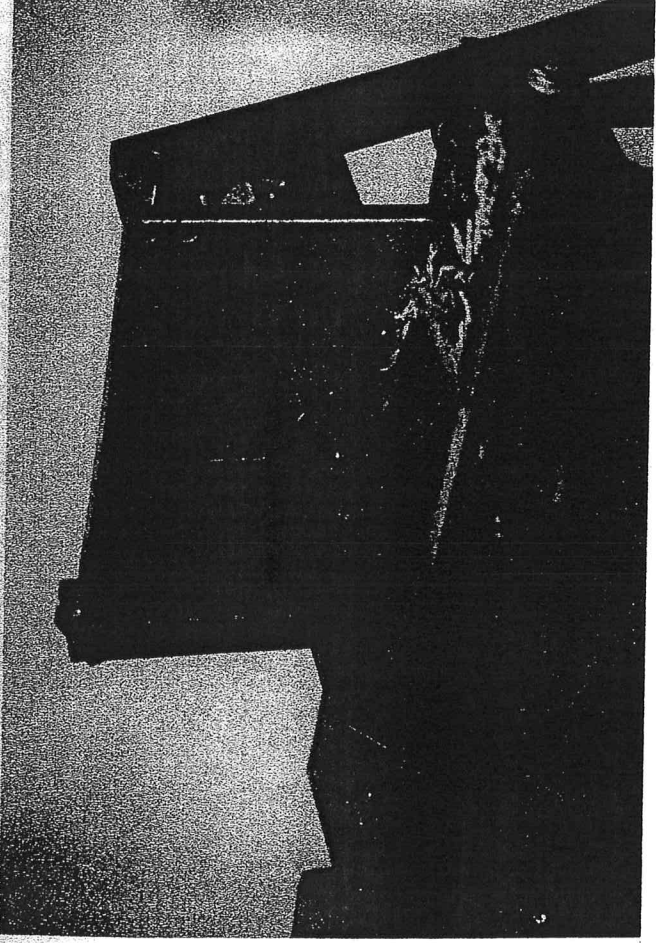


Fig. 5

3. Lower table $\frac{1}{2}$ the thickness of the material. This distance is constant and is unaffected by bit diameter. With piece A flat on table, cut a groove across the end, pushing the board with the miter gauge. (fig. 5)

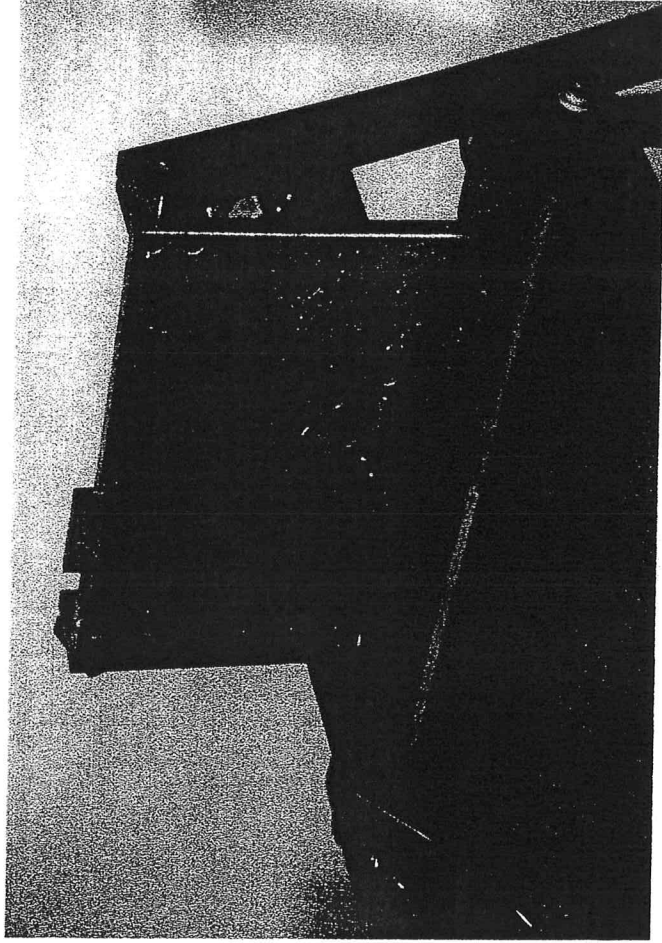


Fig. 6

4. Lower the table 6 turns. Stand workpiece B on its end and cut the socket groove. (fig. 6)

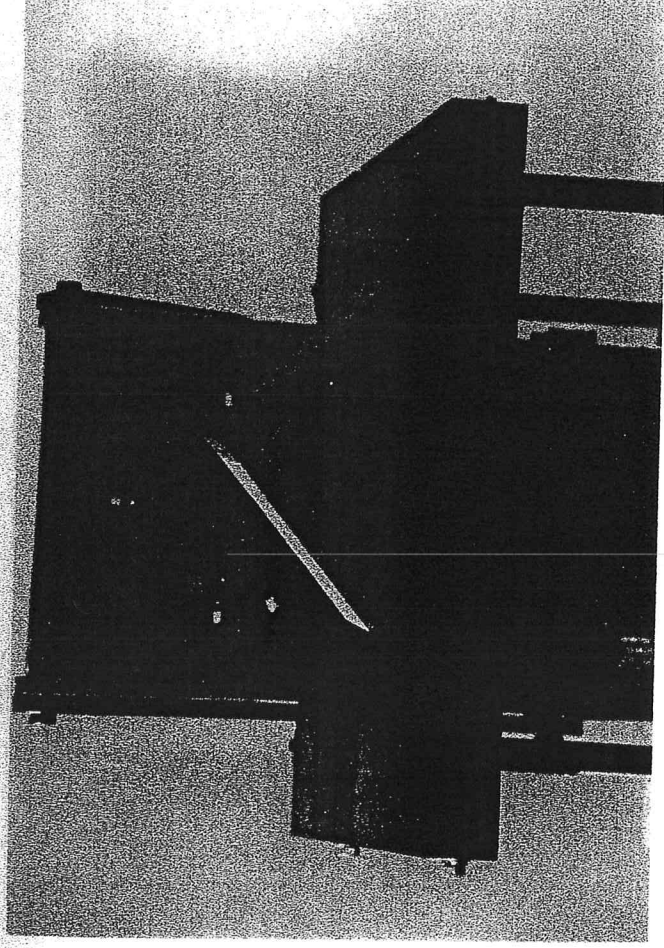


Fig. 7

5. Assemble joint and check fit. (fig. 7)

BLIND MORTISE AND TENON JOINT

Adjust bit depth to desired setting ($3/8''$ is used here). The material used in this example is $3/4''$ thick.

1. Label pieces. Workpiece A will have the tenon, while workpiece B will contain the mortise.
2. Adjust bit height to reference point (see procedure).

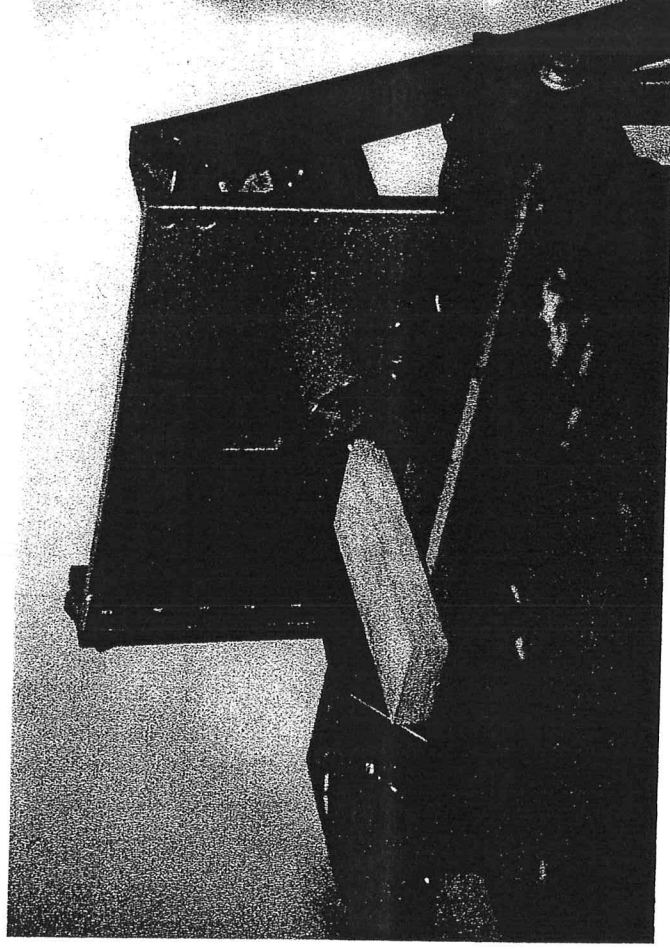


Fig. 8

3. Lower table $3\ 1/2$ turns. With piece A flat on table, make a rabbet cut across the end. (fig. 8)

4. Lower table 10 turns. Make rabbet cut on top of the end of workpiece A, finishing the 5/16" thick tenon.

NOTE: The distance that the table is lowered in steps 3 and 4 varies with the thickness of the mortise and tenon. Although they may be produced in other sizes, it is easiest to make them the same thickness as the bit diameter.

5. Mark the width of the tenon on piece B at the point at which the mortise is desired.

6. Increase bit depth 1/32" for glue clearance.

7. Raise table 4 1/2 turns. This will center the bit in 3/4" material.

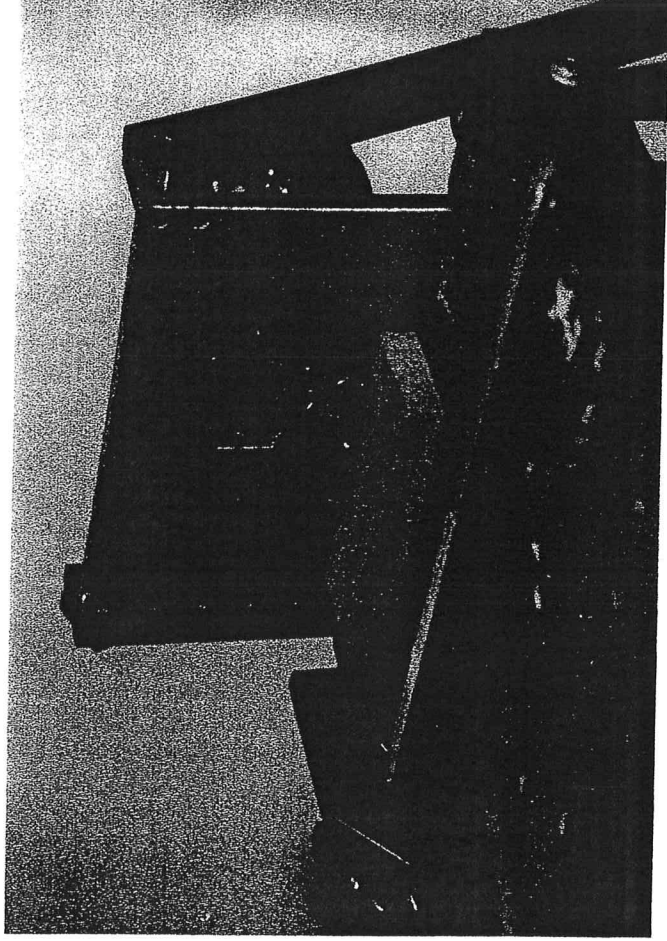


Fig. 9

8. Plunge cut mortise to the width marked. (fig. 9)

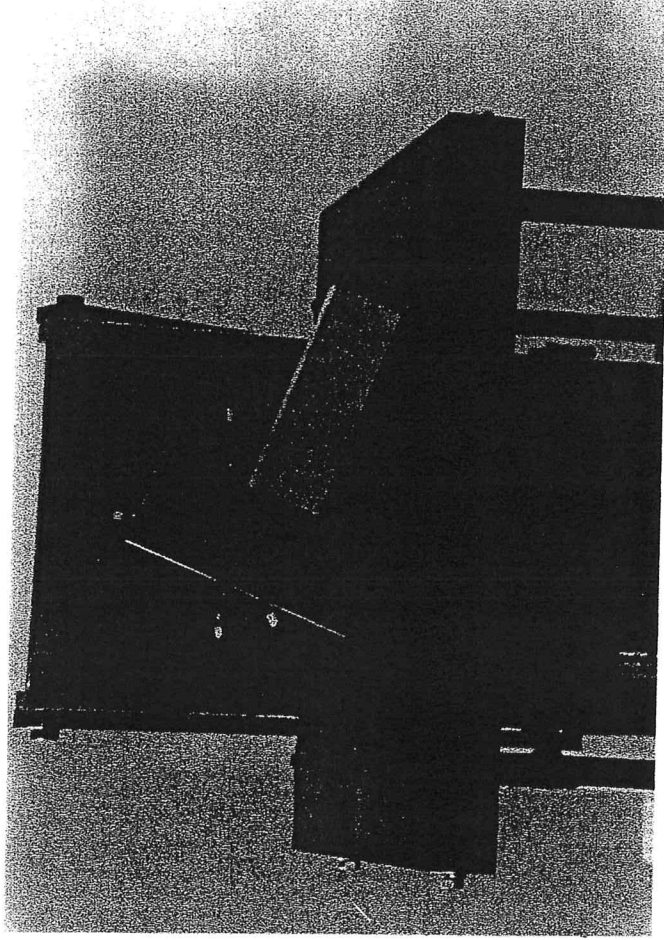


Fig. 10

9. File the corners off of the tenon and assemble. (fig. 10)

LOCKING TONGUE AND GROOVE JOINT

Adjust bit depth to 3/4". The material used in this example is 3/4" thick.

1. Label the workpieces to be used. Workpiece A will contain the groove.

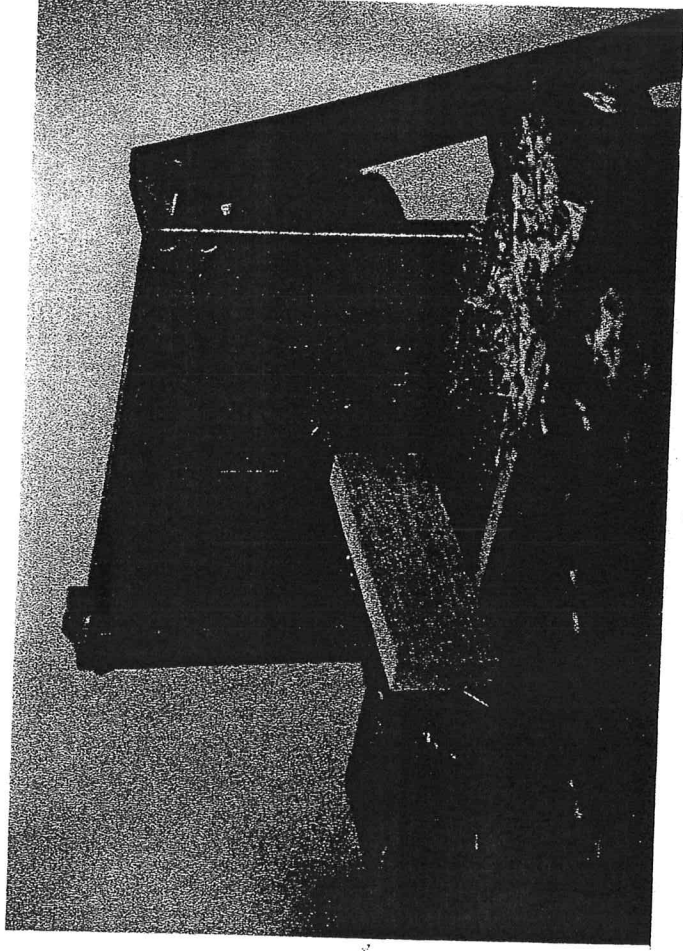


Fig. 11

2. Place piece A on its edge and center the bit to the width of the board. Cut a groove in the center of workpiece A. (fig. 11)
3. Raise the table 5 turns. Place workpiece B on its edge as above and cut groove.

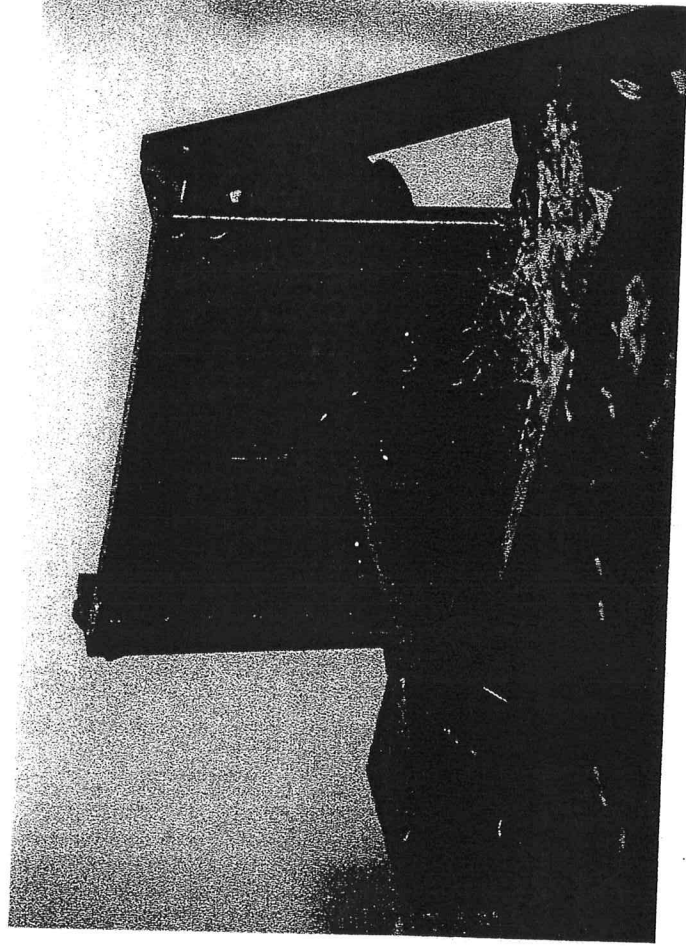


Fig. 12

4. Lower table 10 turns and cut another groove in workpiece B. (fig. 12)
5. Adjust bit height to reference point (see procedure).

6. Lower table 3 1/2 turns. Place piece B flat on table and rabbet cut the edge of the piece to the center tongue. Pull the board away from the cutter bit and restart the cut on the other side of the tongue.

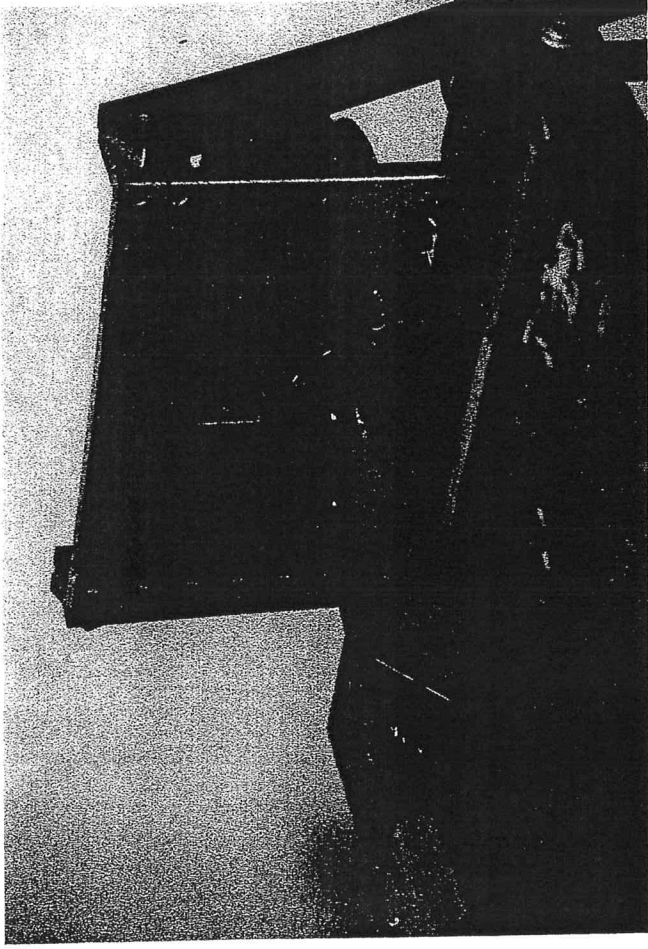


Fig. 13

7. Lower table 10 turns. Make another rabbet cut on the top of piece B in the same manner, leaving the tongue in the center of the board. This will finish the locking tongues. (fig. 13)

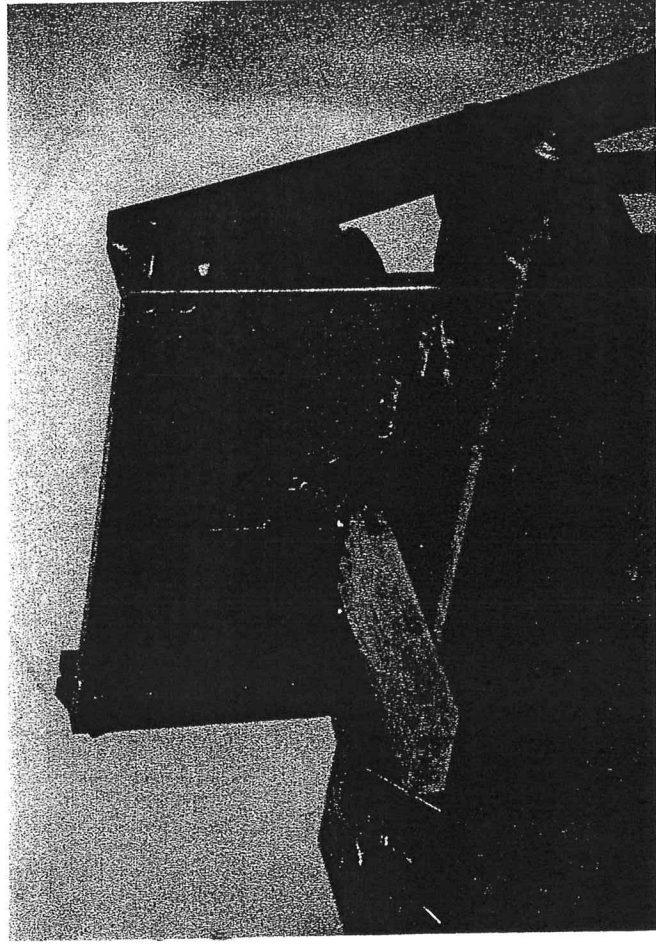


Fig. 14

8. Center the bit to the thickness of workpiece A. Cut an end slot in the piece. (fig. 14)

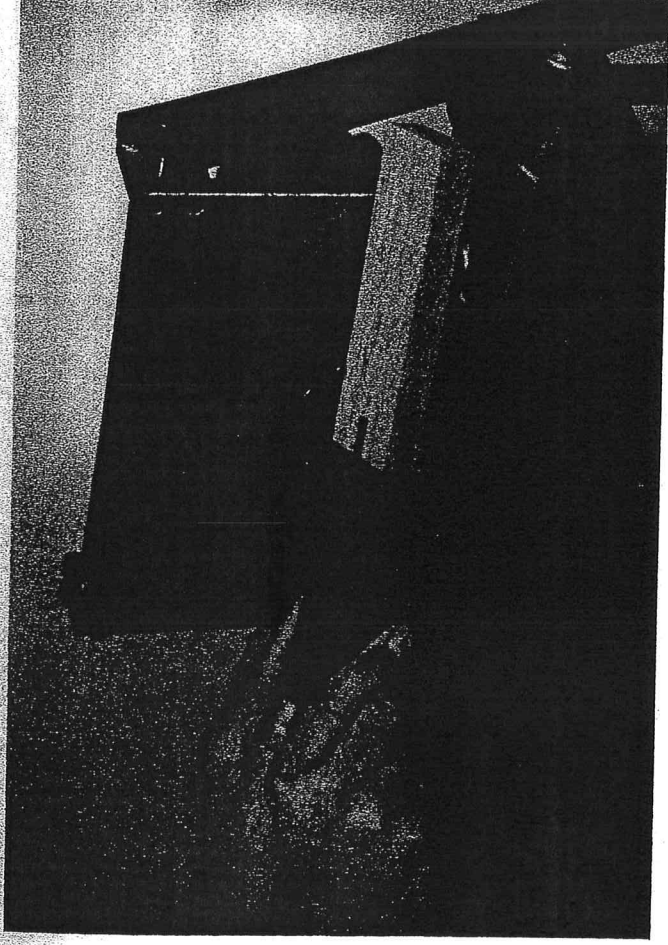


Fig. 15

9. Assemble joint and inspect fit. (fig. 15)

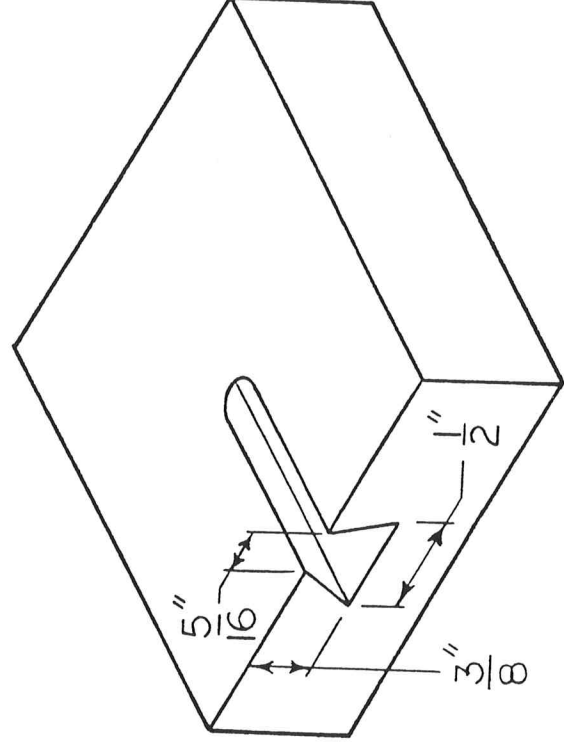


Fig. 16

DOVETAIL JOINTS

All of the following dovetail joints utilize a 1/2" diameter, 14 degree dovetail bit unless otherwise specified. The groove produced by the bit should be 5/16" wide at the top, 1/2" wide at the bottom, and approximately 3/8" deep. (fig. 16)

BLIND DOVETAIL JOINT

Two thicknesses of wood are used in this example: 1/2" for the front or back, and 3/4" for the sides.

1. Label the 1/2" thick workpiece A. Label the 3/4" thick workpiece B. Piece A will have the pins.
2. Adjust bit height to reference point (see procedure).

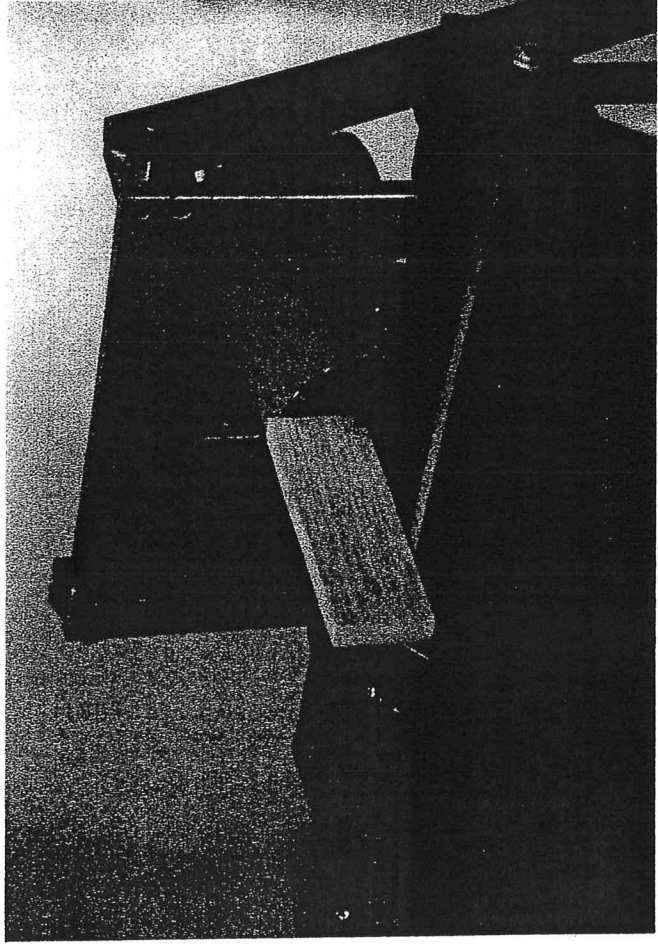


Fig. 17

3. Lower table 4 turns. With workpiece A on its edge, edge cut 1/2 of the first pin. (fig. 17)

NOTE: The distance that the table is lowered in step 3 is not a constant and can be altered. This step determines the point at which the pins begins, which can be changed to accommodate the width of your material.

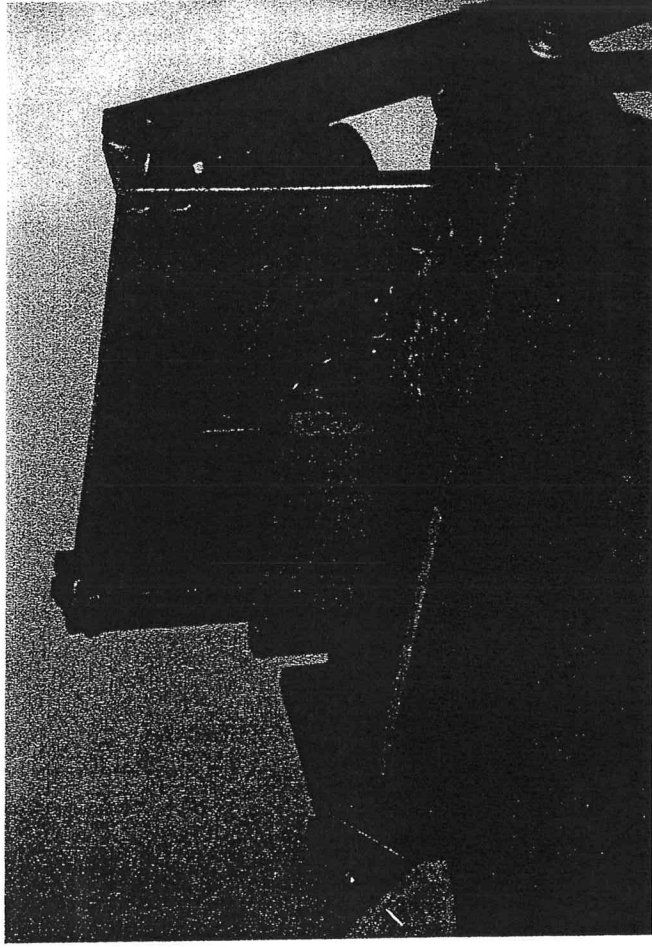


Fig. 18

4. Lower the table 6 1/2 turns. Place piece B on its side against the top plate and cut a socket approximately 1/2" deep. (fig. 18)

5. Lower the table 6 1/2 turns. Cut another end groove in workpiece A, finishing the first pin and beginning the second.
6. Continue this pattern, alternating boards with each step, until the joint is completed.

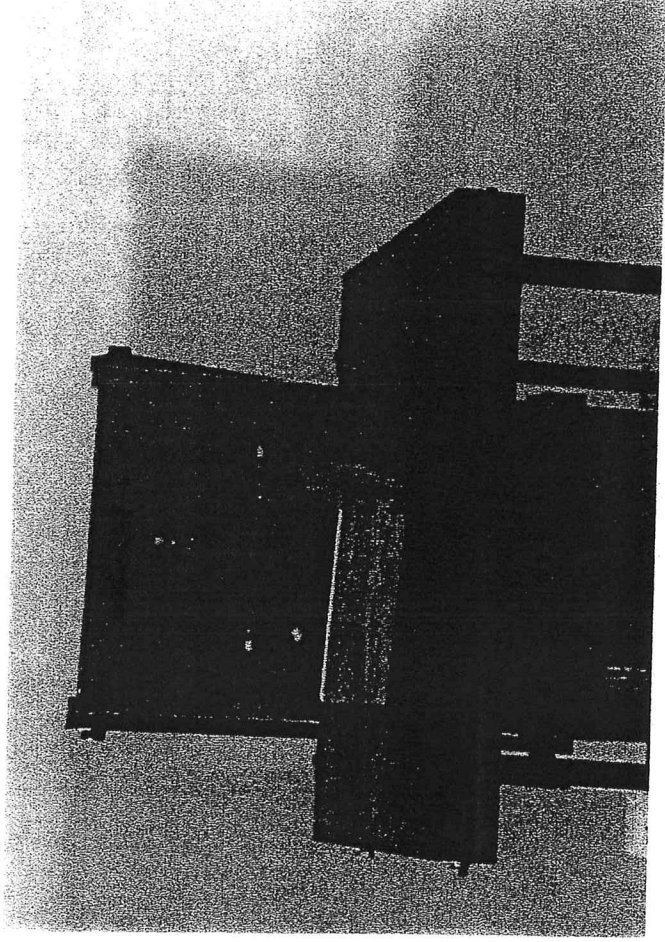


Fig. 19

7. Slide joint together and inspect fit. (fig. 19)

SLIDING DOVETAIL JOINT

For this procedure, use 2" x 2" material for the legs and 3/4" thick material for the sides or aprons and brace.

1. Adjust bit depth to a point where the pins will slide easily into the sockets.

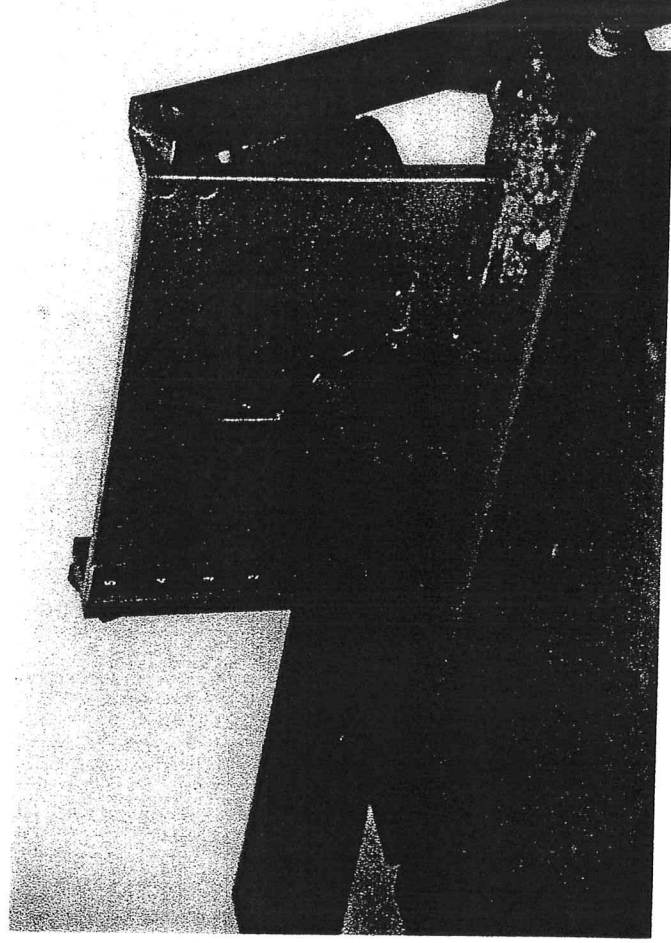


Fig. 20

2. Center bit in leg. Cut sockets in two adjacent sides. (fig. 20)

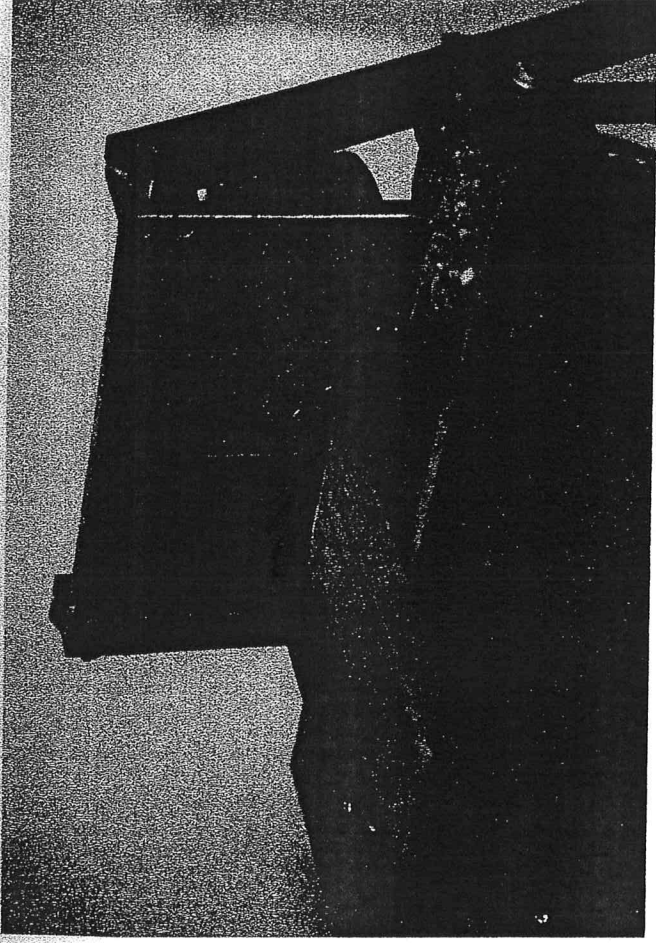


Fig. 21

3. Lower the table 3 1/2 turns. Cut the first side of the dovetail pins on both aprons. (fig. 21)
4. Lower the table 13 turns. Finish the dovetail pins on both aprons.

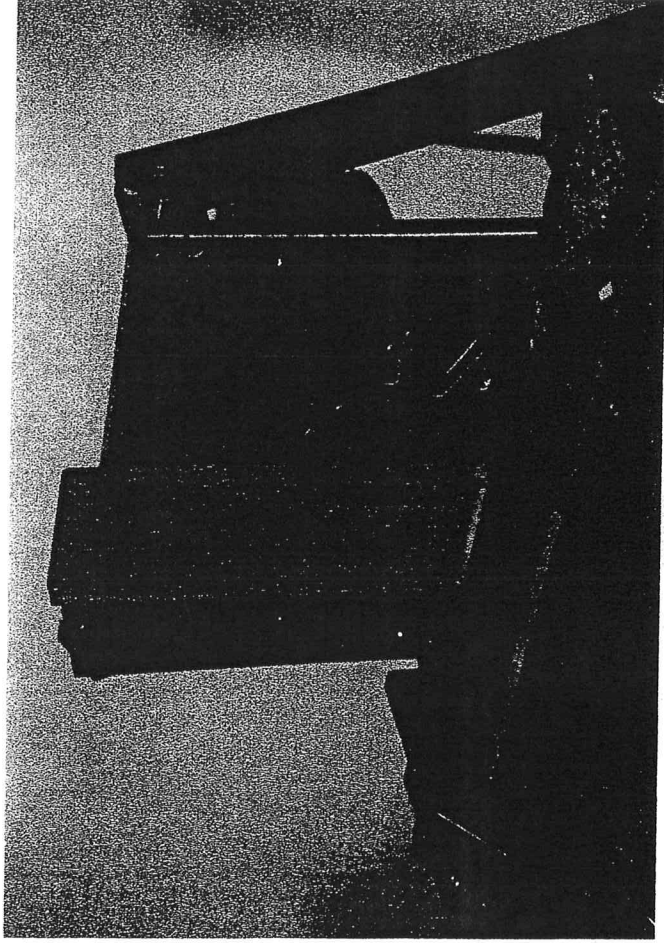


Fig. 22

5. Measure the desired distance that the brace is to be from the leg. Mark this distance on both aprons.
6. Cut dovetail slots in both of the aprons. (fig. 22)
7. Measure and mark brace board. Cut the workpiece to the correct length with 45° ends.
NOTE: Measure the length of the brace board from the bottom of the angles (shortest length).
8. Place the brace board in a 45° fixture. Cut the inside corner of the pins on both ends of the brace board so that the point of the corner is level with the rest of the board. The distance the table is moved will vary depending with the type of fixture used. It may be helpful to make some test passes on scrap pieces until the proper number of turns is discovered.

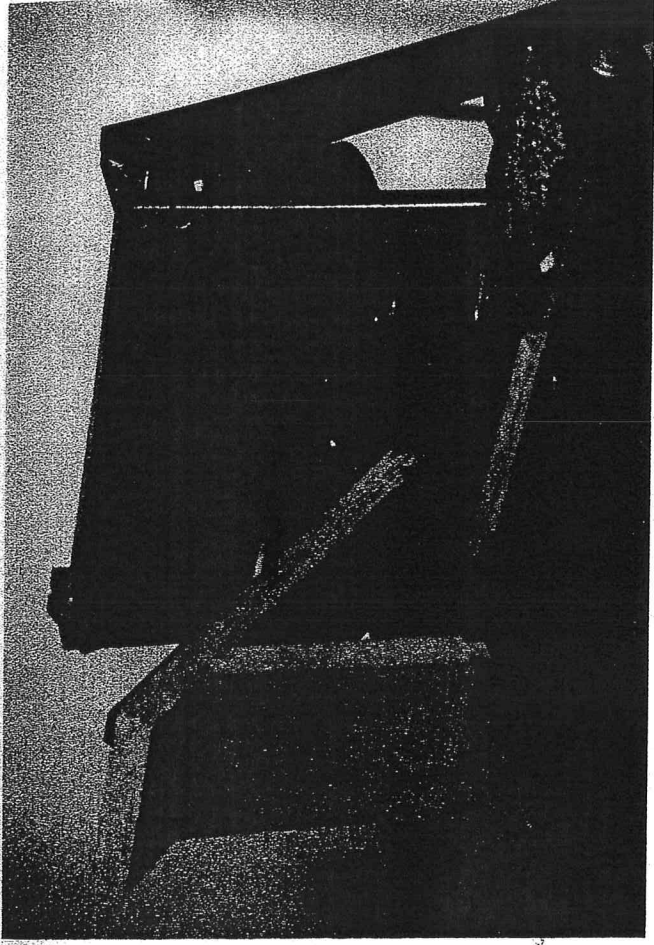


Fig. 23

9. Raise the table 13 turns. Make another cut on both ends of brace, finishing the pin. (fig. 23)

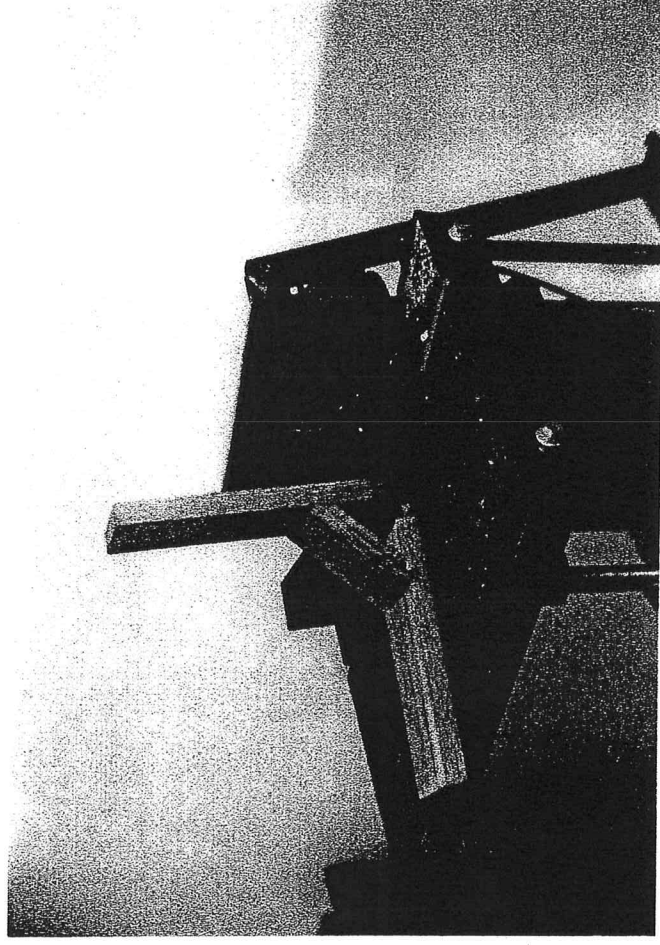


Fig. 24

10. Assemble joint and inspect fit. (fig. 24)

SPLICED DOVETAIL JOINT

This example uses 3/4" material with the ends cut at 45°.

1. Label workpieces A and B.

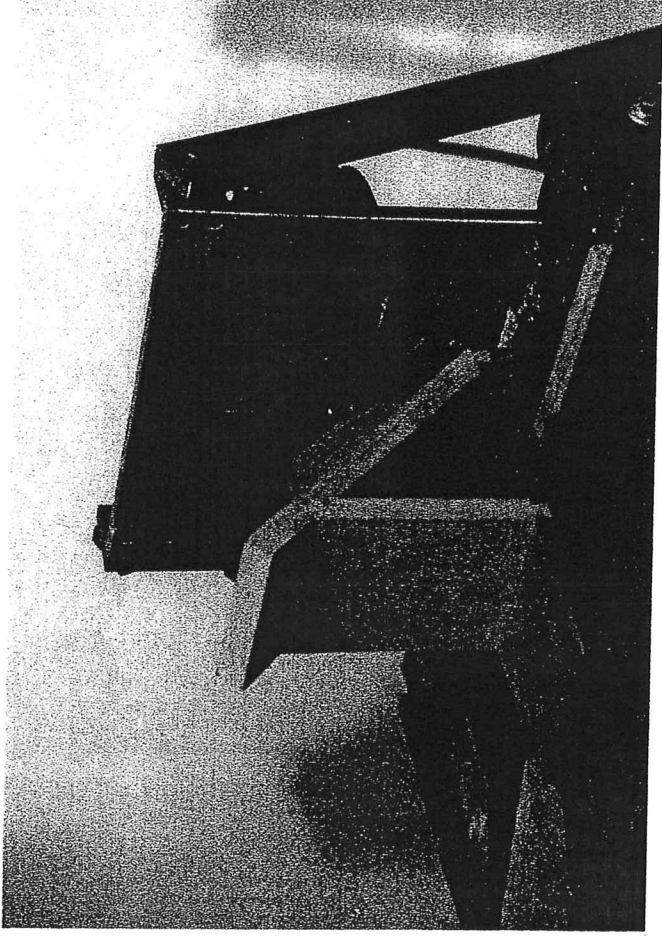


Fig. 25

2. Using a 45° fixture, cut 1/2 of pin on short side of the 45° ends. Be sure the corner of pin is level with the board surface as in step 8 of sliding dovetail instructions. (fig. 25)
3. Raise table 13 turns. Place A and B together on 45 degree fixture and cut end groove.

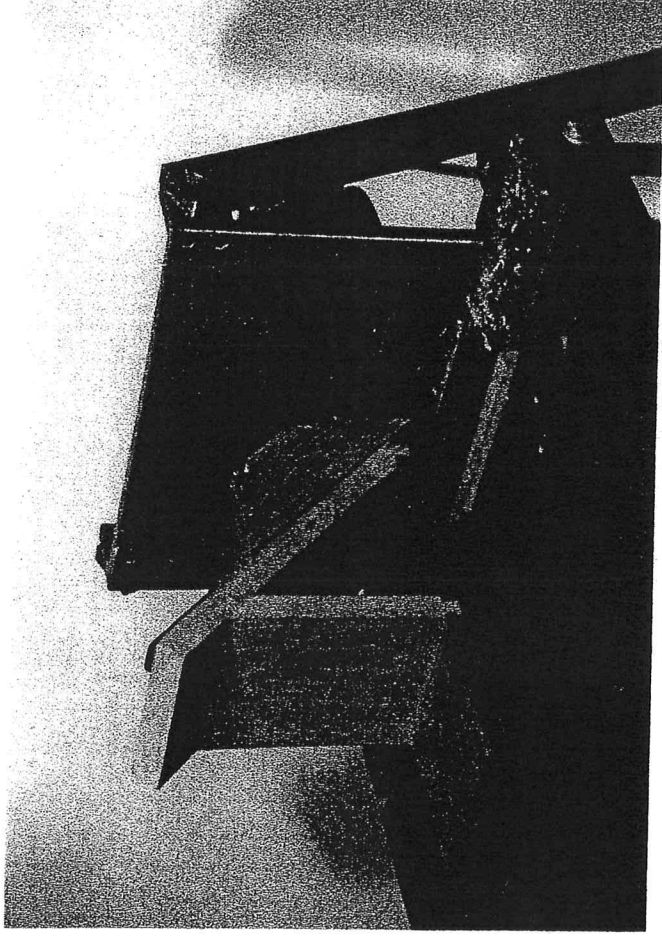


Fig. 26

4. Raise table 13 turns. Cut another end groove in A and B. (fig. 26)
5. Continue this pattern until there is not adequate material for another cut.
6. Remove the remaining material from workpiece A.

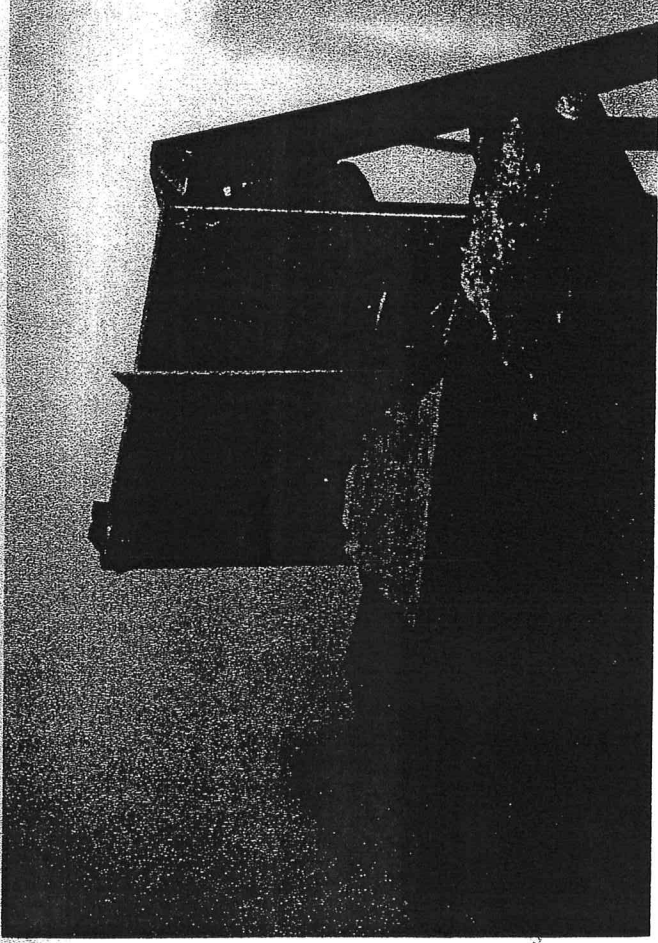


Fig. 27

7. Assemble joint and check fit. (fig. 27)

THROUGH DOVETAIL JOINT

Material for this joint must be $3/8$ " thick. Be sure cutter bit is set to proper depth.

1. Label the boards to be used A and B. Workpiece A will have the pins.
2. Adjust bit height to reference point (see procedure).

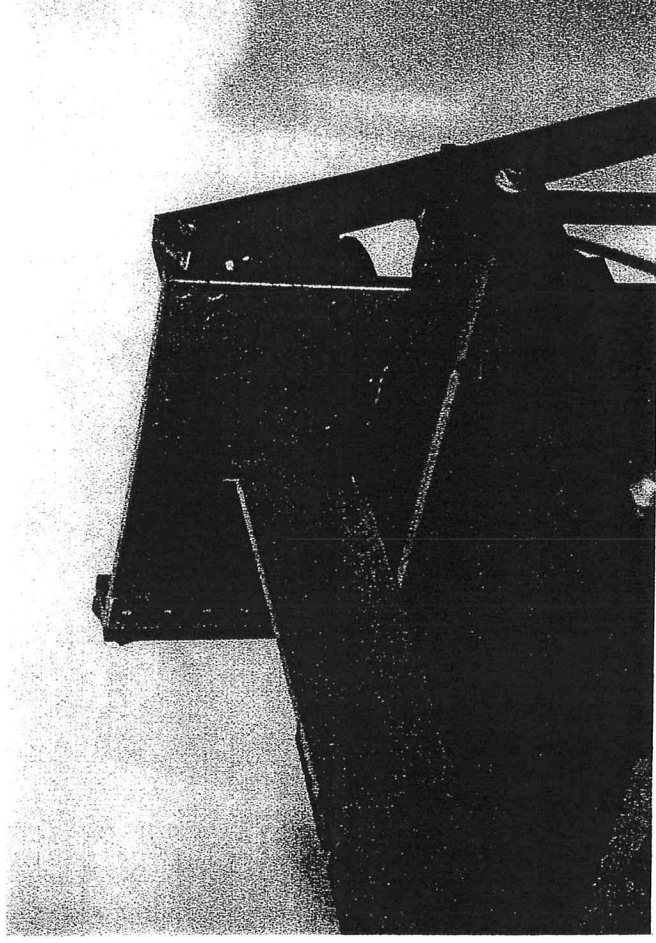


Fig. 28

3. Lower the table 6 turns. Cut end groove in workpiece A. (fig. 28)

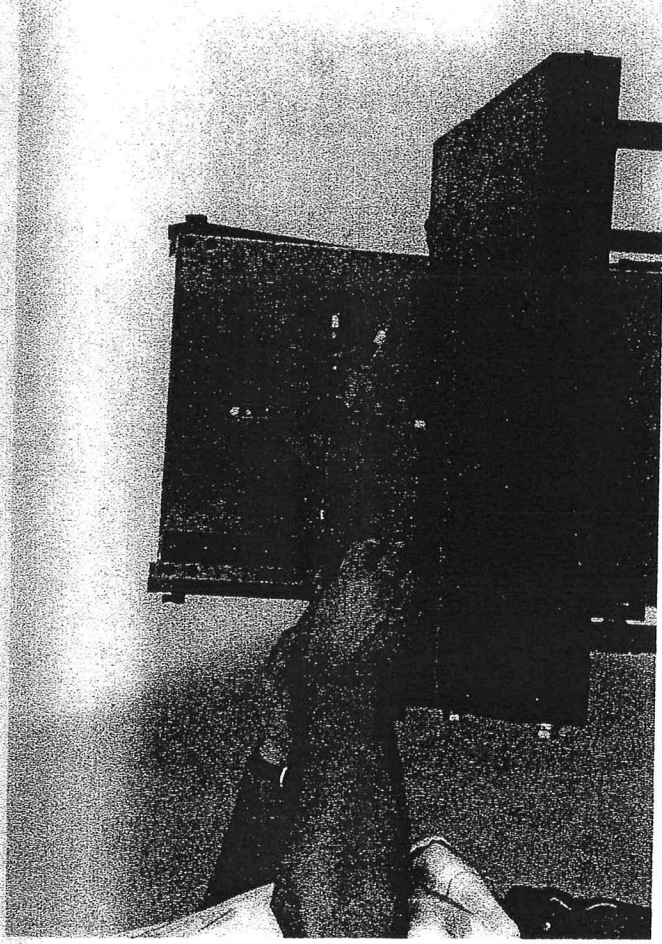


Fig. 29

4. Lower table 1 1/2 turns. Cut into the end of workpiece A to 1/2 the diameter of the bit. (fig. 29)

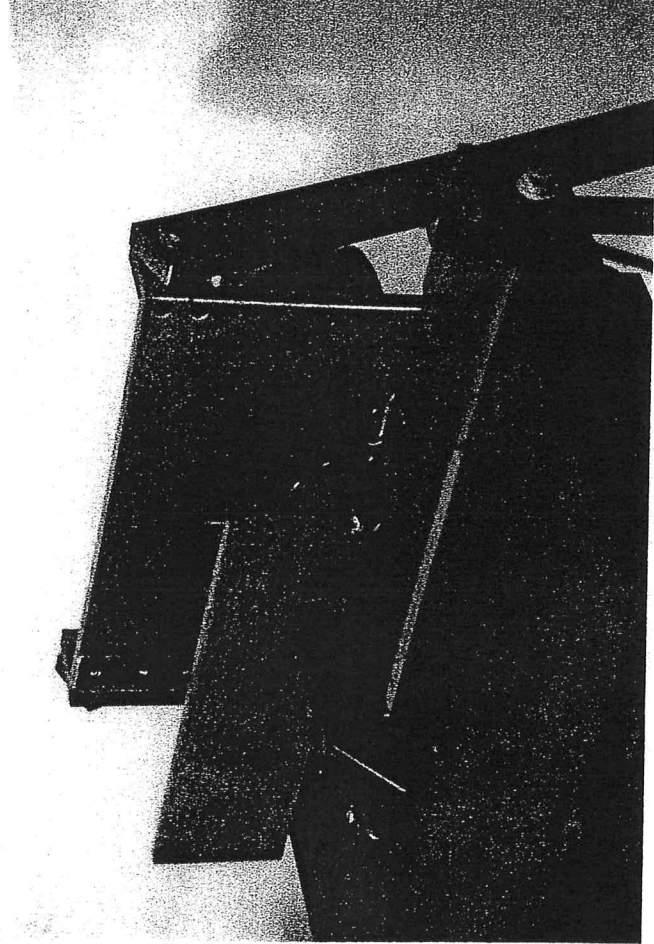


Fig. 30

5. Stand piece A on its side edge and cut into the side 1/2 the diameter of the bit. (fig. 30)

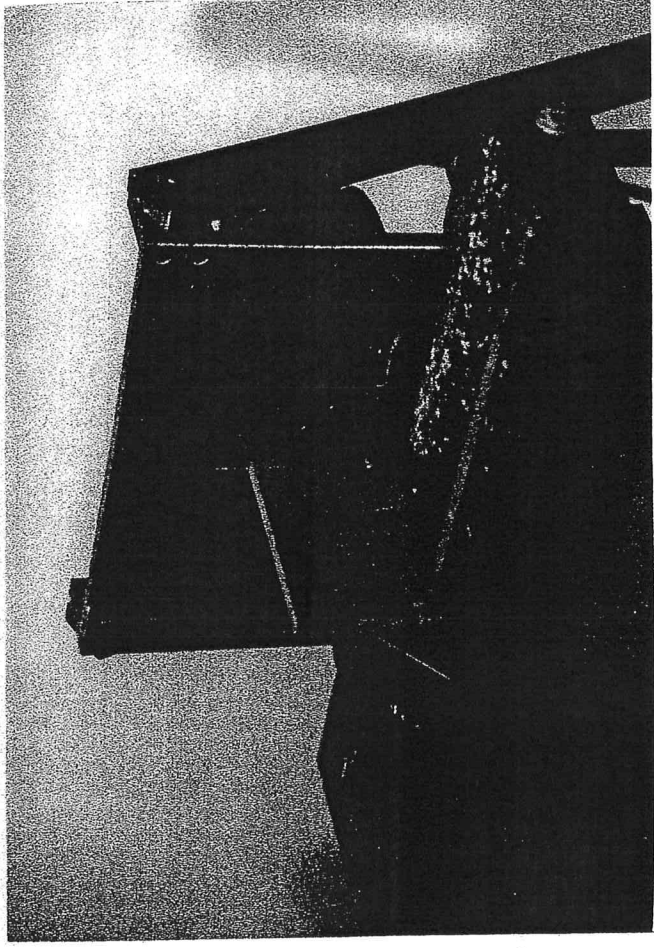


Fig. 31

6. Lower table 6 1/2 turns. Cut a socket in the end of workpiece B. (fig. 31)
7. Lower table 8 turns. Cut an end slot in workpiece A.
8. Raise table 1 1/2 turns. Cut into the end of piece A as in step 4.
9. Stand piece A on edge and cut as in step 5.
10. Lower table 3 turns. Cut halfway into the next pin as in step 4 and 5.
11. Lower table 6 1/2 turns. Cut socket in workpiece B.
12. Continue this pattern until joint is completed.

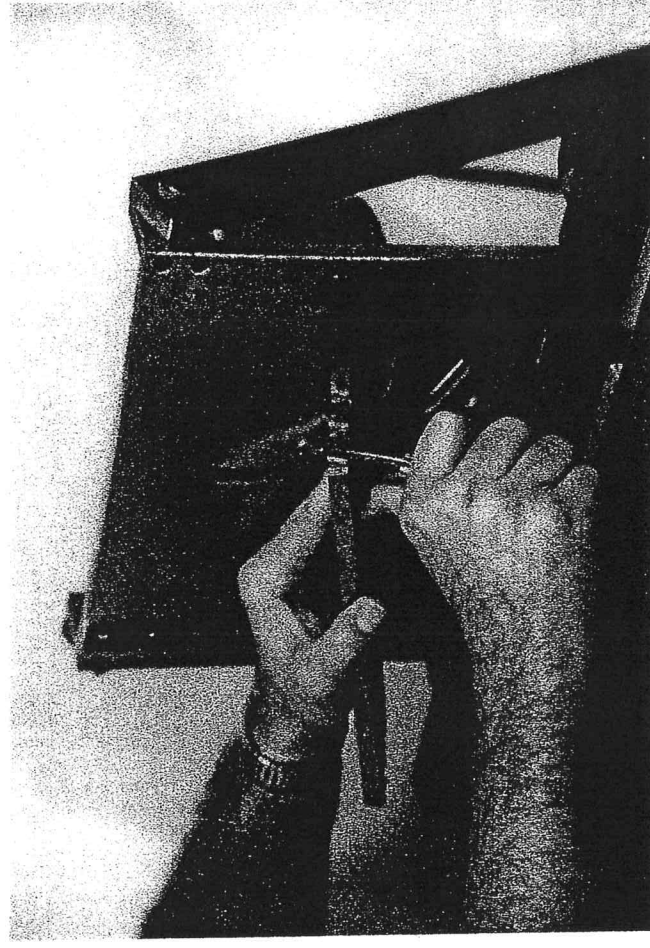


Fig. 32

13. Remove the excess material from the sides of the pins with a knife or chisel, creating smooth, angle pins. (fig. 32)



Fig. 33

14. Assemble joint and inspect fit. (fig. 33)

22 1/2° DOVETAIL JOINT

This example utilizes 1" thick material with the ends cut at 22 1/2°. Two boards joined in this manner create a 45° angle.

1. Label the pieces to be used A and B. Workpiece A will have the pins.
2. Tilt the JM-15 upper plate back 22 1/2°.
3. Adjust bit height to reference point (see procedure).

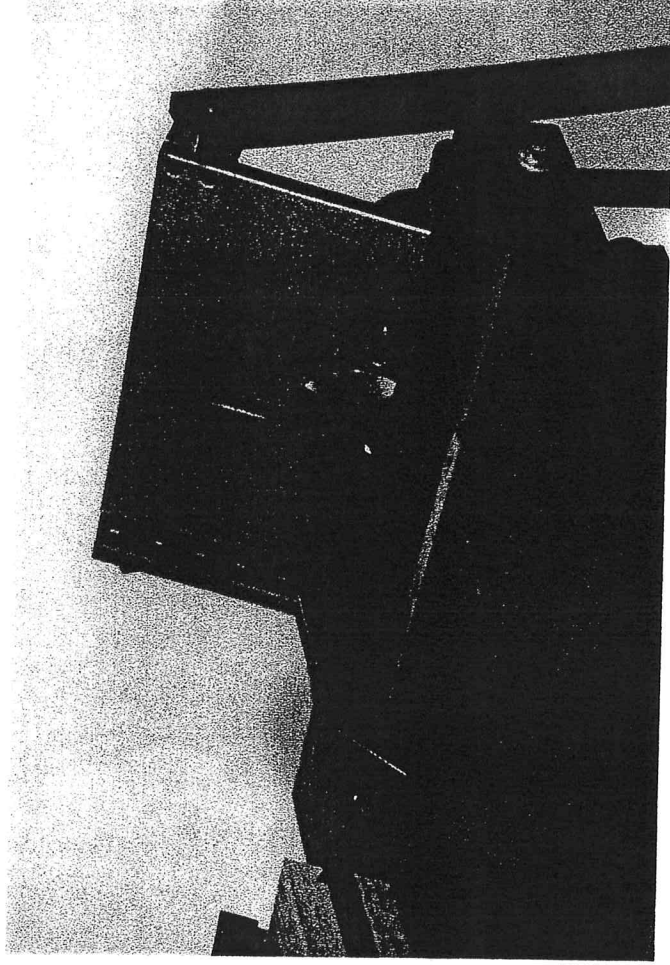


Fig. 34

4. Lower table 3 1/2 turns. Cut an end groove in workpiece A. (fig. 34)

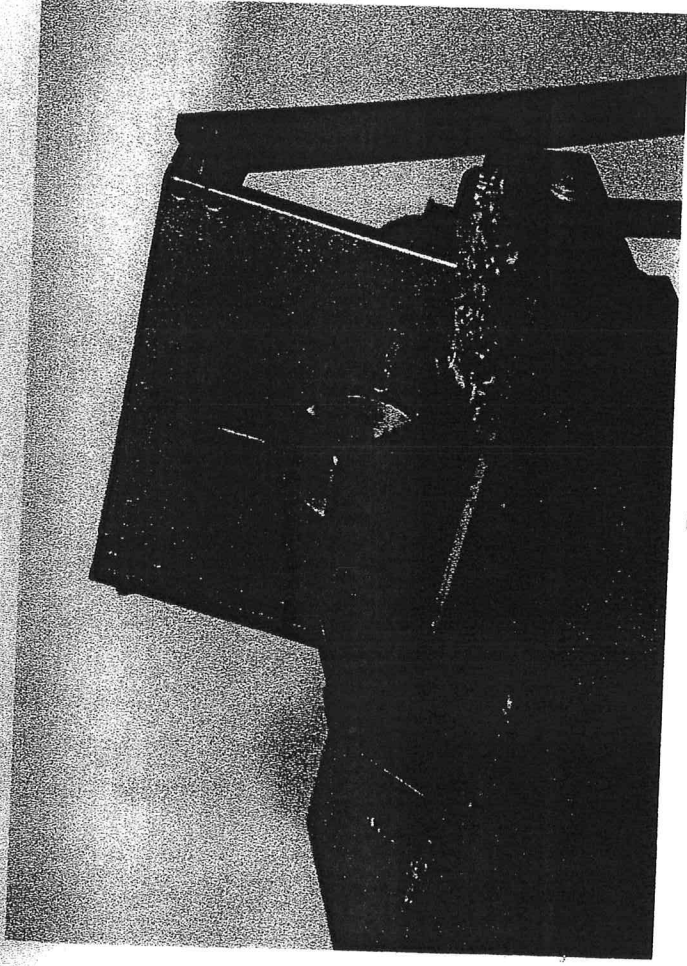


Fig. 35

5. Lower table 8 turns. Make an end groove in workpiece B. This creates the socket for the pin. (fig. 35)

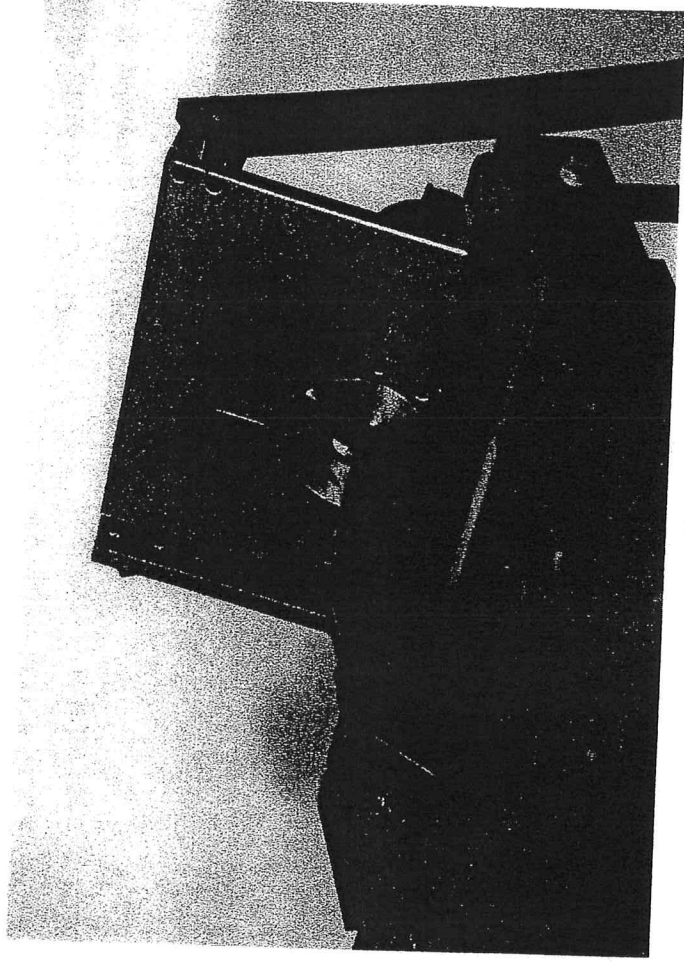


Fig. 36

6. Lower table 4 turns. Make another cut in workpiece A, finishing the pin. (fig. 36)

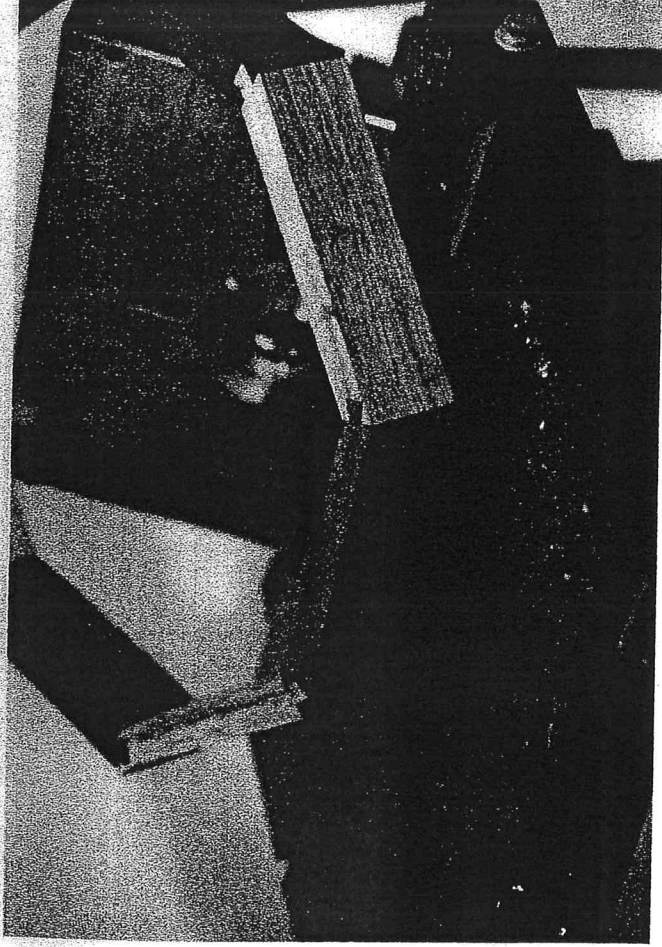


Fig. 37

7. Assemble and check fit of joint. (fig. 37)

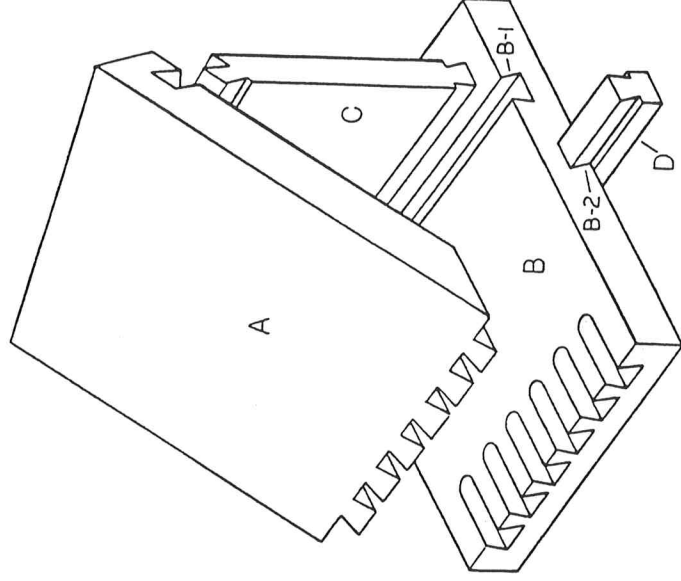


Fig. 38

45° FIXTURE

This procedure requires boards of the following dimensions: $3/4$ " x $5\ 9/16$ " x 11" with one end cut at 45° (piece A), $3/4$ " x $5\ 9/16$ " x $5\ 11/32$ " with one end cut at 45° (piece C), $3/4$ " x $5\ 9/16$ " x $7\ 1/4$ " (piece B). The slide board dimensions are determined by the type of table the Joint Machine has. For fixtures that are to be used on Joint Machines with JM-02 cast iron tables, use a $3/8$ " x $1/2$ " x 10" board. For machines with the JM-50 aluminum table, use a $3/4$ " x $3/4$ " x 10" board (piece D). (fig. 38)

1. Adjust miter gauge to a 45° setting by turning the miter head counter-clockwise.
2. Draw a line across the width of piece B that is $1\ 15/32$ " from the end that will contain the sockets.
3. Adjust bit height to reference point (see procedure).

4. Lower table 9 1/2 turns.
5. Turn machine on. Stand workpiece A on its edge with its side against the miter gauge. Make a pass with this piece, cutting one side of a pin.
6. Lower table 6 1/2 turns. Stand workpiece B on its edge with its side against the JM-15 upper plate. Make a socket by pushing the board into the bit until the cutter radius touches the line.
7. Lower table 6 1/2 turns. Make another cut in workpiece A, finishing the first pin.
8. Continue this procedure, alternating boards with each cut, until all sockets and pins have been cut.
9. Return miter gauge to 90° setting. Return bit height to reference setting (see procedure).
10. Lower table 44 1/2 turns. Place workpiece A on edge with its side against the upper plate and cut a socket across the width of the board.
11. Raise table 24 turns. Place piece B on the end without sockets with side against upper plate. Cut socket B-1 across width of board.
12. Obtain a wooden block that has a 45° side. Place workpiece C on the block and cut a 45° dovetail pin (see steps 8 and 9 in sliding dovetail instructions).
13. Remove 45° block from table. Turn piece C around and make a regular dovetail pin across the width (see sliding dovetail instructions).
14. Adjust bit height to reference point.
15. Lower table 44 turns. Stand workpiece B on the end without sockets with back against upper plate. Cut a dovetail socket across the width of B (aluminum table). If the table is composed of cast iron, install a 3/8" straight (non-dovetail) bit into the router and cut a straight socket.
16. Cut a dovetail pin in workpiece D for aluminum tables. No shaping is necessary for workpiece D for cast iron tables.
17. Assemble fixture and check fit. If satisfactory, disassemble the fixture, then reassemble using glue.

SPINDLE SHAPING

1. To use the Joint Machine as a shaper, tilt the JM-15 downward 90° to a horizontal position.
2. Remove the JM-11 upper plate insert. This allows the larger shaper bits to be installed into the router.
3. Mount the optional Spindle Shaper Fence to the upper plate.
4. Install the desired shaper bit into the router.

INVERTED PIN ROUTING

1. To use the Joint Machine as an inverted pin router, tilt the JM-15 upper plate to a horizontal position. «

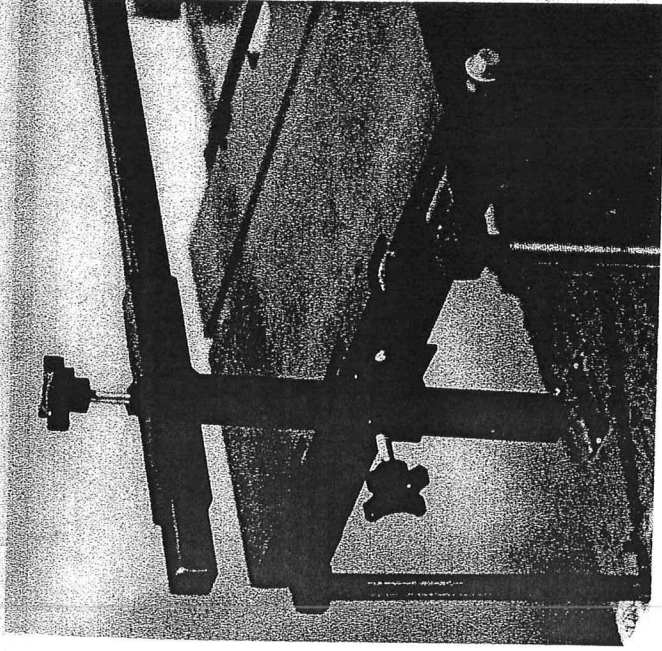


Fig. 39

2. Install the optional JM-81 Pin Router Attachment to the aluminum table. (fig. 39) For Joint Machines with cast iron tables, the JM-85 Adapter Assembly must be used with the Router Attachment. (fig. 40)

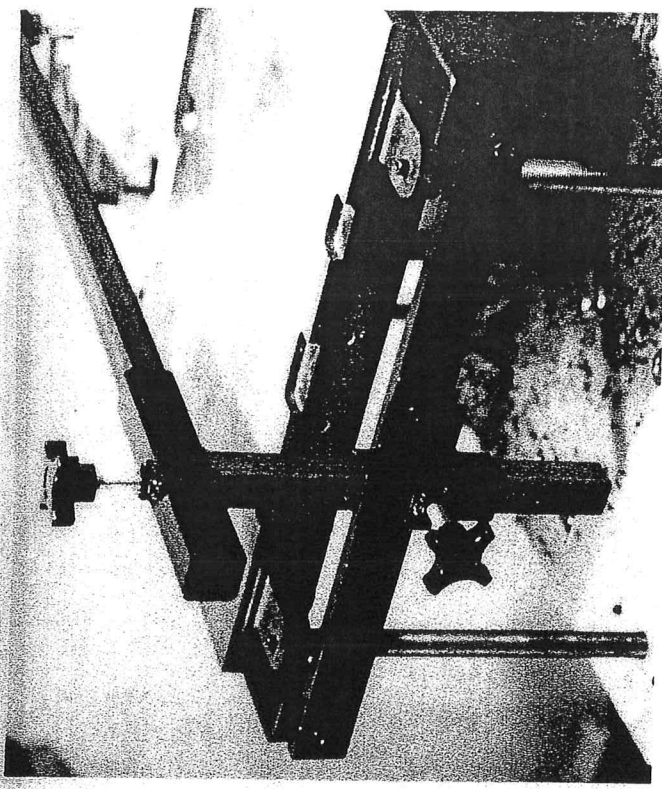


Fig. 40

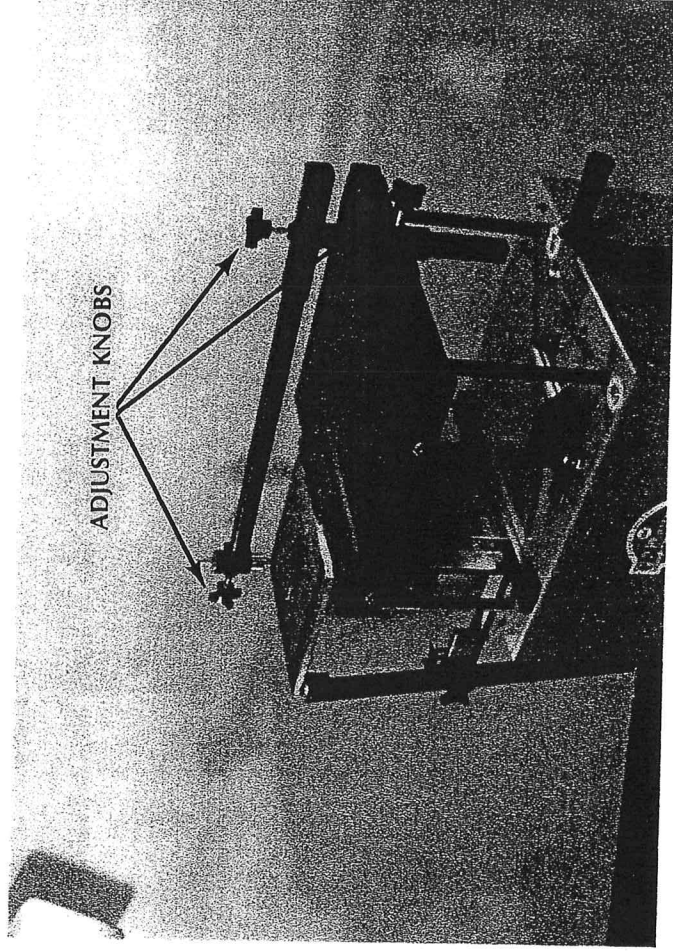


Fig. 41

3. Adjust the assembly to correct height and arm length settings. (fig. 41)
4. Choose and install the proper stylus. The stylus diameter should be the same as the router bit diameter.

LUBRICATION

CORNER SCREW (JM-01)

Apply 2-4 drops of machine oil to the threads of the corner screws slightly above and below the JM-03 cup guides as needed.

CRANK HANDLE SHAFT (JM-53) AND VERTICAL DRIVEN SCREW (JM-08)

Apply 1-2 drops of machine oil on the shaft and screw at the R-369 bronze bushings as needed.

BOSTON BEVEL GEAR (JM-25)

Apply a light coating of lithium grease to gears when needed to reduce friction.

TABLE AND UPPER AND LOWER PLATES

Apply paste or paraffin wax to the table and plate work surfaces to allow easier movement of the workpieces.

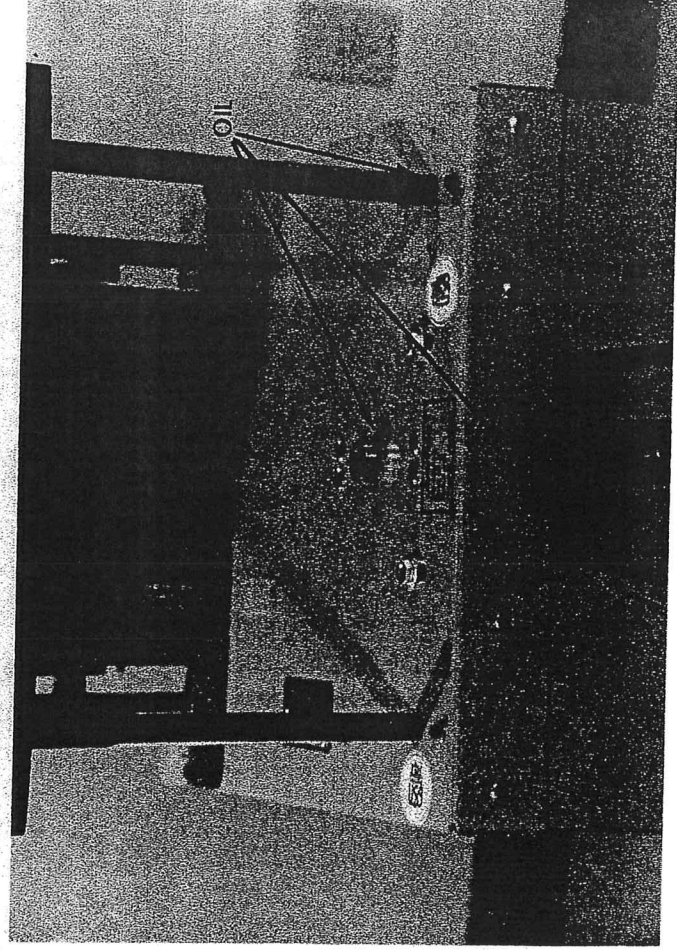


Fig. 42

ADJUSTMENT AND REPAIR

Always disconnect the machine from electrical power before making any adjustments to it.

CHANGING ROUTER BITS

Please refer to the operators manual supplied with the router for cutter bit removal and installation instructions.

TABLE REMOVAL

1. Adjust table height so that the working surface is 1 1/2" below 0 on the height scale.
2. Loosen and remove the four allen head cap screws located in the table ears. (fig. 43)

NOTE: Do not turn crank handle after the four allen head cap screws are loosened. This will alter the level of the table.

3. Lift the table off of the corner screws.
4. Reverse procedure for installation.

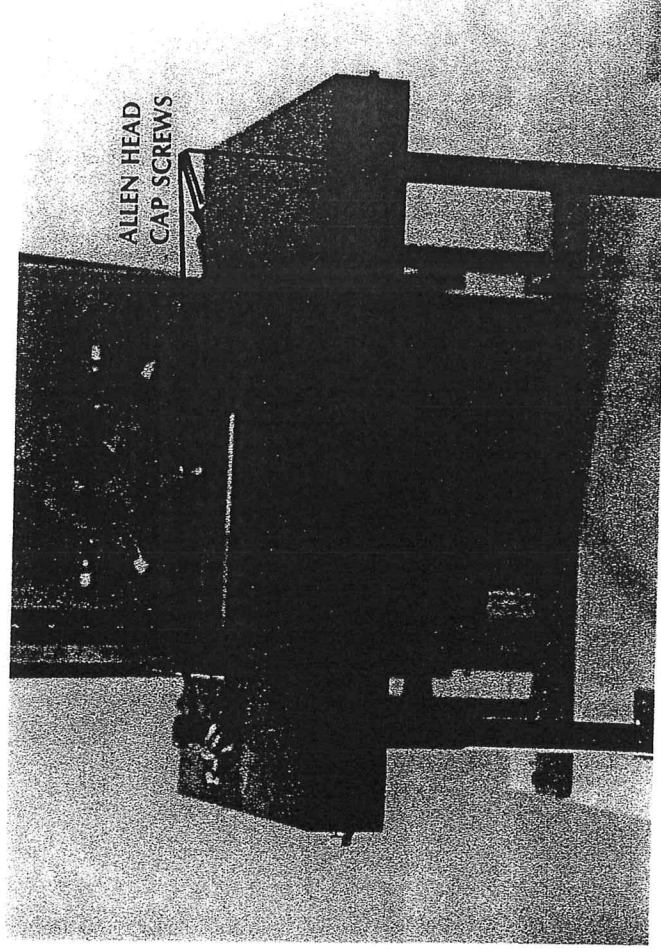
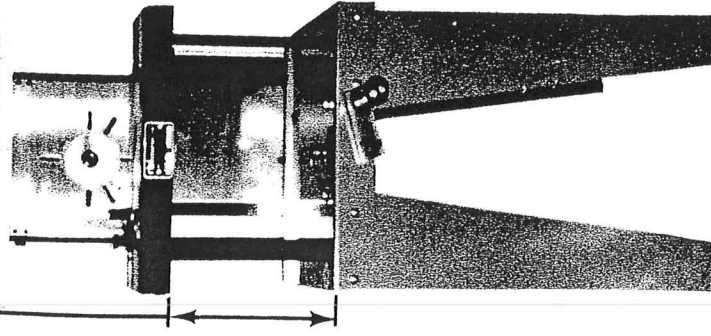


Fig. 43

MEASURE THIS DISTANCE



LEVELING THE TABLE

1. Measure the distance from the working surface of the table to the top of the base at the four corners of table. (fig. 44)
2. If the corners are not at the same level, determine which corner or corners are incorrect.
3. Loosen and remove the allen head screws in the ears nearest the incorrect corners. Adjust the level by turning the corner screw. One complete turn of a corner screw moves that corner $1/16$ ".
4. Recheck the measurements. When the distances are consistent at all corners, install the allen head screws in the table ears.

Fig. 44

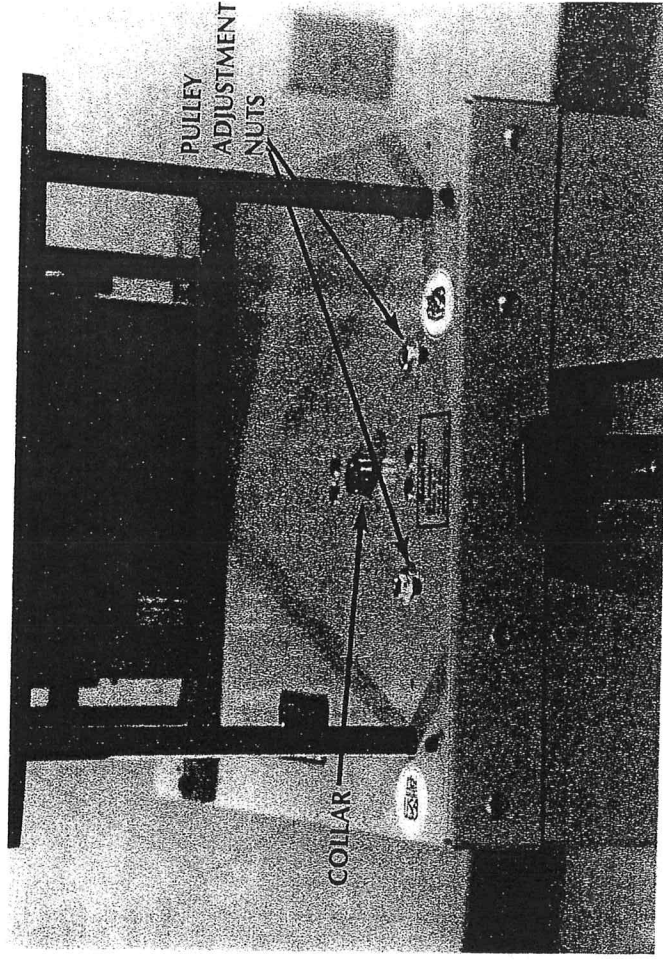


Fig. 45

ADJUSTING THE JM-52 CHAIN

1. Loosen the nuts on the top of the base that secure the RB-62 idler pulleys.
2. To increase tension on the chain, move the pulleys toward the front of the machine.
3. Tighten the nuts on pulleys when chain is at desired tension. The pulley shafts should be at approximately the same position in their slots. (fig. 45)

ADJUSTING THE JM-53 CRANK SHAFT AND JM-08 VERTICAL SHAFT

1. Visually inspect both of the shafts. One shaft may be much further out of adjustment than the other.
2. Loosen the set screw in the collars on the proper shaft or on both shafts if necessary. (fig. 45)
3. Move the shaft in or out until the JM-25 bevel gears mesh properly.
4. Tighten collar set screws.

JOINT MACHINE
MODEL 1218

